

DWR WAREHOUSE

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**EXECUTIVE SUMMARY****Butte Creek Watershed Road Survey****Name of Applicant and Principal Investigators**

Research Foundation, California State University, Chico

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**Project description and Primary Biological/Ecological Objectives**

The Butte Creek Watershed Project (BCWP) in the Department of Geography and Planning at California State University Chico (CSU Chico) and Meadowbrook Conservation Associates are proposing the evaluation of the roads in the upper Butte Creek Watershed to assess the impacts of road related erosion. The BCWP is preparing a Watershed Management Strategy for the Butte Creek Watershed Conservancy in cooperation with and with funding from various state and federal agencies and private stakeholders interests. The BCWP has identified a significant data gap in the existing conditions evaluation in that, although unpaved roads are fairly well mapped, there is no quantitative data on the erosion potential of various road/soils conditions, road management techniques and, in particular, waterway and stream way crossings. Numerous studies have emphasized the major role that forest roads play as contributors of sediment to streams. No comprehensive assessment of watershed condition can ignore roads and their impacts. This project will involve the systematic survey of all roads with the objectives of assessment of the extent and relative magnitude of sediment contribution from road systems in the watershed, identification, mapping, and prioritization of specific road-related sediment sources for treatment, and identification of patterns of recurring problems that can help redirect road construction and road maintenance practices to minimize problems in the long-term. Management that ensures the maintenance and protection of this valuable anadromous habitat is clearly needed to perpetuate this stock of salmon.

**Approach/Tasks/Schedule**

Methodology and protocols will be those as utilized by Plumas National Forest and Natural Resource Conservation Service in previous surveys. The schedule of tasks will include gathering of existing data, developing base maps, training survey crews, surveying, cataloging and data entry of all inventoried sites to be compiled into an electronic database for analyzation of factors and identification of sites attributes culminating in a final report. The project will produce original data sheets sorted and indexed by sub-watershed, a final completion report which presents the study's purpose, methods of analysis, results and conclusions with a comprehensive set of tabular summaries, and maps of all inventoried sediment source areas, precisely located and coded with a unique identifier, at a scale of 1:24,000.

**Justification for project and funding by CALFED**

The Butte Creek drainage is among the last few Sacramento River tributaries that still provide good quality habitat for the production of wild spring-run Chinook salmon. Management that ensures the maintenance and protection of the valuable anadromous habitat is clearly needed to perpetuate this stock of salmon. Watershed restoration efforts are considered by CALFED to be

an integral part in maintaining the good quality shaded riverine aquatic and instream aquatic habitats that still exist. Evaluation of the sediment contribution from the road systems is a fundamental component of watershed assessment. The production of road-related sediment is generally considered as one factor that can influence habitat over the long term. This project will further the efforts supported by NFWF and others to provide a balance between humans and the primary habitats and priority species as identified by CALFED.

#### **Budget costs and third party impacts**

Request from CALFED for budget costs to complete all tasks and phases of the project amount to \$59,490. Potential impacts include identification of sediment sources from third parties that may require remediation.

#### **Applicant qualifications**

The protection and enhancement of local creeks and watersheds by local community groups is a high priority at CSU,Chico. Toward this end, faculty and resources, conservation groups, public agencies, and others as needed are utilized. As part of its community service mission, it is the policy of the University Research Foundation to organize teams for special projects to provide the kinds of services required for this project. Meadowbrook Conservation Associates are specialists in aquatic and riparian systems with extensive experience in erosion and sediment study, aquatic habitat survey, watershed assessment, water quality monitoring and stream restoration. Meadowbrook Conservation Associates have recently completed surveys of road-related sediment sources in the Deer and Mill Creek watersheds.

#### **Monitoring and data evaluations**

Methodology and protocols are well established as utilized by Plumas National Forest and Natural Resource Conservation Service in previous surveys. All data evaluation will be conducted by Meadowbrook Conservation Associates and CSU,Chico in accordance with established protocols

#### **Local support/coordination with other programs/compatibility with CALFED objectives**

NFWF, CSU, Chico and BCWC have been contributing to the program as part of the development of the Watershed Management Strategy. This project will be easy to implement as base maps have already been developed, initial road mileage has been quantified, and assessment protocols have been defined. This project is highly compatible with CALFED objectives of watershed restoration efforts as integral parts in maintaining good quality shaded riverine aquatic and instream aquatic habitats that still exist.

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**Type of organization and tax status**

Auxiliary organization of CSU, Chico as provided for in the Calif. Education Code, Title 5.

Tax status: Non-profit educational 501(c)3

**Tax identification number**

68-0386518

**Technical and Financial Contact person**

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**Participants/Collaborators in Implementation**

NFWFL, USFWS, CALFED, CDF&G, PG&E, Sierra Pacific Industries, Lassen National Forest,  
Butte Creek Watershed Conservancy

**RFP project group type**

Construction acquisition, other services

### **Project description**

The Butte Creek Watershed Project (BCWP) in the Department of Geography and Planning at California State University Chico (CSU Chico) and Meadowbrook Conservation Associates are proposing the evaluation of the roads in the upper Butte Creek Watershed to assess the impacts of road related erosion. The BCWP is preparing a Watershed Management Strategy for the Butte Creek Watershed Conservancy in cooperation with and with funding from USFWS, CALFED, NFWF and other public agencies and various private stakeholders interests. The BCWP has identified a significant data gap in the existing conditions evaluation in that, although unpaved roads are fairly well mapped, there is no quantitative data on the erosion potential of various road/soils conditions, road management techniques and, in particular, waterway and stream way crossings.

Butte Creek provides important migration, holding and spawning habitat for wild spring-run Chinook salmon. Judging by recent salmon surveys, it may be the most important watershed among those that still support the species. The Butte Creek watershed is mostly held in private ownership with a fair amount of Forest Service and BLM land in the upper watershed. Private timber interests dominate the landscape with rural developments along many of the stream corridor areas in Butte Meadows, Jonesville and the Colby Creek areas. Road development has been extensive in the watershed with road densities estimated by Lassen National Forest in the upper watershed at 3-5 road miles per square mile. Numerous studies have emphasized the major role that forest roads play as contributors of sediment to streams. No comprehensive assessment of watershed condition can ignore roads and their impacts.

This proposal will involve the systematic survey of all roads with the following objectives:

- ◆ To assess the extent and relative magnitude of sediment contribution from road systems in the watershed,
- ◆ Identify, map, and prioritize specific road-related sediment sources for treatment,
- ◆ Identify patterns of recurring problems that can help redirect road construction and road maintenance practices to minimize problems in the long-term.

This proposal brings together the stakeholder partnership of the Butte Creek Watershed Conservancy, the resources of CSU Chico and the experience of Meadowbrook Conservation Associates (principal investigators for the *Survey of Road-related Sediment sources in the Deer and Mill Creek Watersheds*).

The project scope will be approximately 150 square miles with 400 miles or less of unpaved forest roads. Major landowners have expressed a willingness to cooperate in the project. Project personnel will include Project Director, Donald Holtgrieve, PhD., BCWP staff, graduate students from CSU, Chico and Meadowbrook Conservation Associates.

The project will produce original data sheets sorted and indexed by sub-watershed, a final completion report which presents the study's purpose, methods of analysis, results and conclusions with a comprehensive set of tabular summaries, and maps of all inventoried

sediment source areas, precisely located and coded with a unique identifier, at a scale of 1:24,000.

This preliminary proposal has estimated the cost of the survey, project personnel and related document publication at approximately \$85,000. Contributions are expected from EPA, CALFED and State Water Resources Control Board.

#### **Location and or geographic boundaries of project**

The upper Butte Creek Watershed, Butte County, California

#### **Expected benefits**

Watershed restoration efforts are considered an integral part in maintaining the good quality shaded riverine aquatic and instream aquatic habitats that still exist. Restoration projects require good planning and a clear understanding of the nature and extent of problems adversely affecting anadromous habitat. Evaluation of the sediment contribution from the road systems is a fundamental component of watershed assessment. While a variety of land management actions within a watershed are known to potentially influence fish habitat, the production of road-related sediment is generally considered as one factor that can influence habitat over the long term. The ultimate benefit of this inventory is that it leads to a coherent strategy to correct existing adverse habitat effects created by road-related sedimentation. Specific benefits include:

- ◆ GIS base maps
- ◆ Identification and treatment of some sediment sources
- ◆ Reduction in runoff affecting peak flows
- ◆ Best road maintenance practices
- ◆ A working strategy document that serves as a tool to reduce runoff, erosion and sedimentation

#### **Background and biological/technical justification**

The Butte Creek drainage is among the last few Sacramento River tributaries that still provide good quality in stream aquatic and shaded riverine aquatic habitat for the production of wild spring-run Chinook salmon. Management that ensures the maintenance and protection of this valuable anadromous habitat is clearly needed to perpetuate this stock of salmon.

The Butte Creek Watershed Conservancy is developing a watershed management strategy aimed at protecting spring-run habitat via improvement in watershed condition and land use practices. A survey of road-related sediment in the Butte Creek watershed is an integral part of the information gathering process necessary to build a sound strategy.

**Objectives.** The overall objectives of this proposal are: 1) to assess the extent and relative magnitude of sediment contribution from road systems in the watershed; 2) identify, map, and prioritize specific road-related sediment sources; and 3) identify patterns of recurring problems that can help redirect road construction and road maintenance practices to minimize problems in the long-term.

### **Proposed Scope of Work**

The work being proposed is a well established method of watershed assessment. The recently completed *Survey of Road-related Sediment Sources in the Deer Creek and Mill Creek Watersheds* serves as the best example of the type of survey proposed here for Butte Creek. A similar study conducted in 1992-92 by the Plumas National Forest on two large watersheds within its jurisdiction used a similar but less detailed approach. In addition, the Natural Resource Conservation Service (formerly Soil Conservation Service) conducted a thorough inventory of sediment sources, primarily road-related, on Grass Valley Creek, a tributary to the Trinity River in Northern California, using a very similar methodology as that proposed here.

Simply stated, the methodology involves the systematic survey of all road segments and road/stream crossings in the study watershed. Erosion features larger than a pre-set minimum threshold will be inventoried and mapped. Several accompanying site variables will also be recorded to help in the identification of risk factors for road erosion. Subsequently, data will be entered into an electronic database where patterns and correlations between erosion, erosion causes, and site attributes can be examined and ranked.

The survey is expected to cover 150 square miles of watershed and 400 miles or less of unpaved forest roads. Major landowners in the watershed (US Forest Service, Sierra Pacific Industries) have expressed willingness to cooperate in this project. Access to small private ownerships, mostly residential, is difficult to obtain and will probably not be pursued. The small area in residential use usually renders this omission insignificant, however urban runoff from the ridge area of Paradise probably contributes significantly to moderate and peak flows in Little Butte Creek. A similar assessment for these areas is underway for the Paradise Irrigation District which serves the domestic water supply for the area.

The survey will proceed as follows:

#### **Task 1**

- Project managers meet with cooperators to refine data form, evaluate criteria, and survey protocol.
- Gather existing data. Emphasis is on soils, geology, road networks, road maintenance histories, air photos.
- Develop base maps of survey area. Sub-watershed delineations will be the primary basis for cataloging survey results.
- Training phase for survey crews. Classroom training on fundamental principles and practices will be combined with field training to orient crews to the project.

**Task 2**

- Field crews to conduct reconnaissance-level survey of watershed to build familiarity with road systems, general nature of road problems, and the watershed itself.
- Operational phase of the survey. All road segments and crossings will be catalogued. Mapping and data entry are concurrent with field survey. All inventoried sites will be carefully located by road milepost and mapped.
- Principal investigator and project managers will provide supervision and quality control checks on field crews as survey progresses.

**Task 3**

- At the completion of the survey, data will be compiled into an electronic database. Data will be analyzed to quantify total road-related sediment contribution, identify major causes of road erosions, prioritize sites for treatment, and identify site attributes that are risk factors for erosion.
- Preparation of draft final report and other deliverables. Circulate draft for review by all cooperators. Meet with cooperators to critique the draft and provide opportunity for any direct input.
- Finalize and distribute report.

Deliverables for this project include: 1) original data sheets, sorted and indexed by sub-watershed; 2) a final completion report which presents the study's purpose, methods, results, and conclusions with a comprehensive set of tabular summaries; and 3) maps of all inventoried sediment source areas, precisely located and coded with a unique identifier, at a scale of 1:24000.

**Monitoring and Data evaluation**

Methodology and protocols are well established as utilized by Plumas National Forest and Natural Resource Conservation Service in previous surveys. All data evaluation will be conducted by Meadowbrook Conservation Associates and CSU,Chico in accordance with established protocols.

**Implementability**

This is a ready to go project having support from NFWF. Meadowbrook Conservation Associates have the experience from their recently completed surveys of road-related sediment sources in the Deer and Mill Creek watersheds. CSU,Chico is currently involved in watershed analysis and management strategy development. This project will be easy to implement because base maps have already been developed, initial road mileage has been quantified, and assessment protocols have been defined.

### Costs and Schedule to implement proposed project

#### Budget Costs

Project Phase and task	Direct labor hours	Direct Salaries and benefits	Overhead labor (general, admin and fee	Service contracts	Materials and acquisition contracts	Miscellaneous and other direct costs	Total costs
Task 1	527	8308	2328	6667	2000	1833	21136
Task 2	527	8308	2328	6667		1833	19136
Task 3	527	8308	2328	6667		1833	19136

#### Scheduled Milestones

**Task 1** Gather existing data, develop base maps, train crews 05/15/98

**Task 2** Survey, catalogue, data entry 10/15/98

**Task 3** Compilation into electronic database, identification of site attributes, critique of final draft, distribution of report 03/15/99

#### Third Party Impacts

Potential impacts include identification of sediment sources from third parties that may require remediation..

## **Applicant Qualifications**

### **CALIFORNIA STATE UNIVERSITY, CHICO Statement of Capabilities for Watershed Research and Planning**

The protection and enhancement of local creeks and watersheds by local community groups is a high priority at California State University, Chico. Toward this end, faculty and resources, conservation groups. Public agencies, and private consultants as need are utilized. As a part of its community service missions, it is the policy of the University Research Foundation to organize teams for special projects and to provide the kinds of services described below.

**Project Administration:** The Research Foundation, as part of its regular operation, searches for government and foundation funding opportunities, makes contact with those organizations and provides assistance in grant proposal writing. Foundation personnel then administer the grant funds, provide auditing, and bookkeeping functions, and insure compliance with all government regulations and procedures.

**Faculty:** The primary mission of our faculty is teaching our own students. However, with funds generated from grants and contracts, our faculty often undertake research, planning, and other community based projects. Faculty who have particular expertise in watershed research and planning are listed on attached pages. Faculty can also be of service by supervising interns and conducting class projects that relate to the mission of the watershed protection groups (see below). Environmental education faculty are also available to assist local school teachers in creating and teaching curricula about our region's diverse natural environments.

**Department, Institutes, Centers and Laboratories:** Special units of the university are often organized and called upon to address specific community and regional needs. Those related to watershed protection are listed on the attached pages. In addition to the more obvious administrative units, such as the Department of Geography and Planning, there are others that could be called on to fill specific needs, such as the Department of Communication Design and Journalism, which can produce informational material such as newsletters, videos, and press releases. The Geographic Information Center (GIC) has the capability of collecting and compiling public domain maps through the internet as well as producing GIS maps on request.

**Internships and Class Projects:** Other possible resources are community based internships supervised by several of the departments and faculty listed on the attachments. In the past, interns have gained personal knowledge and skills while providing community service in environmental monitoring, report writing, field mapping, GIS mapping, interviewing informants, documentary research, classroom teaching assistance, plan design, and questionnaire design and administration. Such win-win arrangements can also be established for small groups of students, and sometimes an entire class may be organized around a particular issue or need, e.g., Geography 224 Planning Studio.

**Project Personnel:****Director:**

**Dr. Donald Holtgrieve**, Professor of Geography and Planning, CSUC. He teaches courses in water resources and environmental planning. Dr. Holtgrieve has been the recipient of many grants and awards, with a particular focus on the environment, specifically water quality and watershed management. He has extensive experience in directing grants awarded by both State and Federal Agencies, as well as official certification in Land Use, Transportation, and Wetlands Planning. Dr. Holtgrieve has supervised over 200 projects over the last 25 years. As Project Director, Dr. Holtgrieve will provide assurance that adequate resources are provided to the project, and will be the first line of communication between CAL FED Category III and CSU Chico.

**Manager:**

**Allen Harthorn, MS.**, has many years of experience managing projects for CSU Chico, as well as being an avid fisherman. His personal involvement with and love for the Butte Creek Watershed led him to help organize the Butte Creek Watershed Conservancy. Mr. Harthorn was personally responsible for obtaining the initial USF&WS grant to develop a Management Strategy for the Butte Creek Watershed. As Project Manager, Mr. Harthorn will be responsible for public outreach efforts, education, grant writing as well as continuing to develop his extensive and exhaustive list of professional, agency and personal contacts for the Watershed Program

**Office Manager:**

**Laura Lukes** has managed project offices for the Research Foundation since April of 1994. She has excellent organizational, managerial, and fiscal accounting skills, as well as knowledge of and experience with fiscal regulations for state and federal grant accounting. Ms. Lukes is responsible for all internal accounting for grants and contracts, document management, and the overall smooth running of the particulars and paperwork for the project.

**Meadowbrook Conservation Associates:**

**Michael Kossow** is a fisheries and biological technician with fifteen years of experience in water quality monitoring, sediment sampling, hydrography, and biological assessment of aquatic communities.

**Kenneth Cawley** is the responsible for flood-event sediment studies, wetland delineation, stream habitat studies, fish ladder design and construction, and watershed assessment and survey or road-related erosion and sedimentation in watershed in Northern California. He also brings the experience and expertise of serving thirteen years with the US Forest Service as a hydrologist.

## NONDISCRIMINATION COMPLIANCE STATEMENT

FD-101 (REV. 3-88) FMC

COMPANY NAME

CSU, Chico Research Foundation

The company named above (hereinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 (a-f) and California Code of Regulations, Title 2, Division 4, Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, disability (including HIV and AIDS), medical condition (cancer), age, marital status, denial of family and medical care leave and denial of pregnancy disability leave.

## CERTIFICATION

*I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.*

OFFICIAL'S NAME

Jeff Wright

DATE EXECUTED

7/25/97

EXECUTED IN THE COUNTY OF

Butte

PROSPECTIVE CONTRACTOR'S SIGNATURE

PROSPECTIVE CONTRACTOR'S TITLE

Director, Office of Sponsored Programs

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME

CSU, Chico Research Foundation